NCHSR

Health Care for the Aging

Resource Requirements of Nursing Home Patients Based on Time and Motion Studies

Long-Term Care Studies Program
Research Report

RA
997
R63
1987

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
National Center for Health Services Research
and Health Care Technology Assessment

April 1987

Background

Pamela C. Roddy, Ph.D., is a biochemist with the National Institute of Mental Health; she is a former NCHSR health services researcher. Korbin Liu, Sc.D., a demographer, is a senior research associate with the Urban Institute. He was senior research manager of NCHSR's Health Services for the Aged Studies Program. Mark R. Meiners, Ph.D., a health economist, is senior research manager of NCHSR's Long-Term Care Studies Program.

Additional information on the Health Care for the Aging Research Program is available from the National Center for Health Services Research and Health Care Technology Assessment, 18A-55 Parklawn Building, Rockville, MD 20857; 301/443-2560. Inquiries may be directed to the Health Services for the Aged Studies Program or to the Long-Term Care Studies Program.

Copies of NCHSR publications are available from the NCHSR Publications and Information Branch, 18-12 Parklawn Building, Rockville, MD 20857; 301/443-4100.

The following bibliographic citation is recommended for this publication:

Roddy, Pamela C., Korbin Liu, Mark R. Meiners. *Resource Requirements of Nursing Home Patients Based on Time and Motion Studies*, Long-Term Care Studies Program Research Report, DHHS Publication No. (PHS) 87-3408. U.S. Department of Health and Human Services, National Center for Health Services Research and Health Care Technology Assessment, April 1987.

ISBN 1-55808-001-5

Health Care for the Aging Research Reports present findings from studies conducted by the Long-Term Care Studies Program and the Health Services for the Aged Studies Program, components of the Division of Intramural Research, National Center for Health Services Research and Health Care Technology Assessment (NCHSR). This series presents information useful to those making administrative or policy decisions on matters related to long-term care or the general problem of health care for the elderly.

Overview

With improvements in medical technology and an increase in life expectancy, there also has been a substantial increase in the number of individuals with chronic diseases.

Policy research now being conducted by the NCHSR intramural research program is concerned with defining the dimensions of the problems of caring for the chronically ill and identifying various approaches to organizing, financing, and delivering acute and long-term care services. The chronically ill elderly, who absorb an evergrowing proportion of our public and private resources, are of particular concern.

The intramural research program is concerned specifically with such problems as:

- the size and sources of our expenditures for long-term care
- the feasibility of alternative financing and reimbursement strategies
- the factors that affect the demand for and use of long-term care services
- the types of care that might be required for particular levels of functional disability
- the cost and economic implications of informal support systems
- the organization and coordination of social and medical services and
- the economic and social implications of alternative health care and living arrangements.

This research report presents analysis using data from a major demonstration and evaluation project which studied the consequences of using incentive payments to change admission, discharge and outcome patterns for Medicaid patients in nursing homes. In this experiment incentive payments were provided:

- to encourage nursing homes to admit highly dependent Medicaid residents who might otherwise be hospitalized inappropriately
- to improve the nature of the care provided by the nursing home by setting target outcome goals for specific patients and by establishing formal treatment plans for achieving these goals
- to encourage more appropriate discharges by encouraging institutions to provide case-management services, and by paying additional sums in situations in which discharge resulted from improved care.

An incentive-payment system was developed to reward facilities for achieving the various admission, treatment and discharge objectives. The experiment was carried out in 36 proprietary, Medicaid-certified, skilled nursing homes in San Diego County. These nursing homes had a combined Medicaid inpatient census of about 3,600 residents. The experiment lasted 30 months. The first 6 months (November 1980 through April 1981) provided baseline data on the nursing homes, their residents, and their methods of operation. Homes were subsequently assigned to either a control group or a treatment group. During the next 2 years (May 1981 through April 1983), an incentive-reimbursement system was employed in paying for care in nursing homes included in the treatment group.

The data collecting, training and supervising of a local field team of qualified geriatric nurses and the disbursing of incentive payments to the nursing homes were the responsibilities of Applied Management Sciences, Inc. (funded by contract OASH 233-79-3019). All participating nursing homes were required to sign subcontracts with the contractor guaranteeing provision of data and accepting the incentive-reimbursement system as well as judgments made by the local field team on authorization for payment to the treatment homes.

RA
997
.R63
1987

Admission, discharge, assessment, goal setting and care planning of residents remained the responsibility of the nursing homes. The contractor's local field team authorized:

1. Incentive payments on behalf of Medicaid residents according to the study's resident-classification system;
2. Outcome-incentive payments for eligible residents who successfully achieved previously approved care goals, and
3. Discharge-incentive payments on behalf of residents who were discharged and maintained at lower levels of care for at least 90 days.

The incentive-payment system was designed to achieve each of the study's objectives; that is, an admission incentive was paid to encourage homes to admit sicker Medicaid residents who required above-average care; an outcome incentive was paid to encourage homes to expand their nursing care services; and a discharge incentive was paid to encourage appropriate discharges and to provide case-management services.

The reimbursement system adhered to a number of basic principles:

1. All incentive payments were paid in addition to the Medicaid reimbursement.
2. Current Medicaid residents as well as new Medicaid admissions (or residents converting to Medicaid) were eligible for incentive payments.
3. Admission-incentive payments were paid on a monthly basis, outcome-incentive payments were paid on a quarterly basis, and discharge-incentive payments were prorated on a monthly basis following discharge.
4. Admission-incentive payments were paid on a prorated basis for residents who died or were transferred to a hospital because of an unavoidable change in health status.
5. The amount of the admission-incentive payment was not decreased as the resident improved; an increase was effective for the quarter following an unavoidable decline in health status.
6. Admission-incentive payments continued for 3 years beyond the end of the demonstration period for residents admitted during the first year of the treatment period.

The admission-incentive payments were computed based on the mean time per patient day required for each nursing care activity. This mean time was linked with a composite wage, which was weighted by the skill mix of nursing home staff delivering the care service, to arrive at the mean nursing costs. The payments were designed to compensate for the costs of heavy-care patients which exceeded the amount paid by Medicaid.

The computation of the outcome-incentive payment was based on:

1. The basic services required in order to achieve the goal
2. The mean time required to perform the services
3. The skill mix of nursing personnel involved in service delivery and their composite hourly wage and
4. The average number of days needed to achieve the goal.

The discharge-incentive payment rates include two components: vacant beds and staff effort. Since the vacant bed costs varied by a facility's bed capacity, two discharge-incentive rates were set based on the Medicaid SNF-bed rates that went into effect at the time of the study. The incentive payment covered up to 10 days of vacant bed cost for a timely discharge. The staff effort component of the incentive payment was intended to cover the cost of discharge planning, coordinating and followup.

This report presents the results of the work sampling and time and motion studies conducted on the nursing home personnel used to determine the numbers, types and frequencies of services provided to nursing home patients. These studies were conducted to determine a reasonable reimbursement scheme with appropriate incentives to encourage appropriate admission and outcome goals. The work sampling and time and motion data collected were used to develop an empirical relationship between patient impairment levels and nursing time requirements. Previous reports in this series provide data and analysis on other aspects of the research project.

Acknowledgment

The data presented in this report are from a demonstration study designed by William G. Weissert, formerly with the National Center for Health Services Research, who together with Douglas E. Skinner, formerly with Applied Management Sciences, Inc. (AMS), directed the demonstration through the planning and early implementation stages. AMS project staff on this study included James Bremer, Margot Cella, Daniel Cohn, Robert Deane, Carolyn Goodman, Billie Hulse, and Alfred Meltzer. The AMS field team in San Diego comprised Donna Inversin, senior nurse assessor; Elizabeth Brandon, Lois Beagin and Gloria Rodriguez, nurse assessors; and Linda Graham, research assistant.

The California Department of Health Services was directly involved in planning the study and formally requested waivers of several Federal regulations in order that the demonstration could be implemented. Elisabeth Lyman and Lynda Martland assisted the project.

The California Association of Health Facilities, Inc., was involved in the demonstration through its local affiliate in San Diego. Richard Hebbel and Kennon Shea participated in the effort.

NCHSR conducted the demonstration in cooperation with the Health Care Financing Administration (HCFA), which granted the necessary waivers of Federal regulation. The HCFA project officers on the study are Don Sherwood and Teresa Schoen.

Consultant panel members Sidney Katz, Judy Williams Powell, William Scanlon, Thomas T.H. Wan, and T. Franklin Williams contributed to the design of the demonstration.

Resource Requirements of Nursing Home Patients Based on Time and Motion Studies

Pamela C. Roddy, Korbin Liu, and Mark R. Meiners

Medicaid is the source of payment for 42 percent of total annual nursing home expenditures *(1)*. Consequently, the manner in which Medicaid reimburses for nursing home care is important to providers of care and Medicaid program costs.

Within the general guideline of paying amounts commensurate with economically and efficiently operated facilities, each State can determine how to reimburse its nursing homes for services under Medicaid. While there is considerable variation in the specific characteristics of State Medicaid reimbursement systems, the majority of States pay nursing homes on a flat rate basis per patient day, with adjustments based on facility characteristics, such as number of beds and geographic location *(2)*. Since a flat rate usually reflects the average cost for all facilities and not the costs incurred by any given institution, nursing homes have an incentive under such a system to minimize costs by admitting those patients who require the least amount of care. The financial incentives associated with flat-rate systems, therefore, provide disincentives for nursing homes to accept heavy-care patients or to provide levels of care that exceed the per diem reimbursement amounts *(3)*.

In recognition of the potential problems with patient access and quality of care associated with flat-rate systems, States have considered the development of reimbursement systems that account for the different service requirements of people who use Medicaid-covered nursing homes. A few States—Ohio, Maryland, Illinois and West Virginia—have developed reimbursement systems that are "case mix" adjusted, with payments varying according to the levels of impairment and the special care needs of Medicaid patients. The case-mix adjustments employed by these States were developed on the basis of independent research on nursing home case mix and resource consumption and special studies conducted by the four States to implement their case-mix adjustments *(4)*.

The prior research on nursing home case mix found that levels of disability and need for special services were directly associated with staff-time consumption, with specific medical diagnoses being far less important *(5, 6)*. However, with the exception of the Ohio and Maryland systems, derived nursing times for case-mix reimbursement systems were based on normative standards rather than empirical studies. Even in the case of the empirical studies, the determination of nursing-time requirements (staff time expended) for specific patient types was based on small samples of patients *(4)*.

Because of limitations in these studies, there is uncertainty about the specific amounts of resources that are required to perform specific nursing home care functions and the cumulative amount of resources that are required for specific patient types.

In order to develop a generally acceptable standard for nursing home case-mix requirements, further research is required to provide a better empirical understanding of the relationship between patient characteristics and resource requirements. This research report presents results from a study of nursing home case mix and resource consumption that was a central element of a broader study of reimbursement incentives for nursing homes, the NCHSR Nursing Home Incentive-Reimbursement Study, sponsored by the National Center for Health Services Research and Health Care Technology Assessment. This report discusses the methodology used by the study to derive nursing home case-mix measures and describes the measurement procedures for determining the amounts of nursing home staff time required to perform specific functions for patients, such as assistance in bathing. The results of the function-specific time requirements are used to determine the overall resource requirements of specific patient types, according to several approaches for classifying patients. Finally, the results are compared with those of other studies on resource consumption by patient type, and the implications of findings for further research and policy are discussed.

Data and methods

NCHSR Nursing Home Incentive-Reimbursement Study. NCHSR researchers designed and implemented an incentive-reimbursement system to determine if access could be enhanced for heavy-care Medicaid patients by making payments to facilities based on case mix. The major objective of the study was to encourage nursing homes to admit highly dependent Medicaid patients who might otherwise remain inappropriately hospitalized, thus incurring unnecessarily high costs for their care. An incentive-payment system that rewarded facilities for admitting such patients was tested using a controlled experimental research design. Additional objectives, designed to complement the admission incentives, were to determine if special incentive payments also

would improve patient outcomes through rehabilitation and care planning and encourage appropriate discharges through case-management services provided by the nursing home. The results of these studies have been published *(7, 8)*.

The experimental payment system for Medicaid patients was implemented in proprietary skilled nursing facilities (SNFs) in San Diego County, California. Throughout California, most Medicaid-certified nursing homes are classified as skilled nursing facilities. In 1980, skilled nursing facilities accounted for 90 percent of Medicaid nursing days in California and 86 percent in San Diego. Of the 41 proprietary SNFs in San Diego, 36 agreed to participate in the study. These facilities accounted for 70 percent of all Medicaid SNF patients in the county. The facilities were stratified by location, common ownership and number of Medicaid patients and were allocated randomly to a control and an experimental group.

Empirical relationships between patient-impairment levels and nursing-time requirements were developed in order to determine a reasonable reimbursement scheme with appropriate incentives to meet admission and outcome goals. For this purpose, work sampling and time and motion studies of nursing home personnel were conducted to determine the number, type and frequency of services provided to nursing home patients *(7)*.

Case-mix measurement. Prior research has shown that nursing home residents' functional dependencies and needs for special services are good predictors of nursing home resource consumption. The NCHSR study developed an extensive assessment instrument to determine nursing home residents' health status characteristics embodying these factors *(9, 10, 11)*. The assessment of patients was conducted at the time of admission and 90, 180, and 360 days after admission for all patients in the 36 facilities who were admitted over an 18-month period (November 1980 through April 1982), as well for all study Medicaid patients who were current residents in the experimental facilities in November 1980. The core of the assessment instrument contained a series of detailed questions on individual patient performance of specific activities of daily living (ADL), such as bathing, dressing, toileting, transferring, continence and eating, as well as on physical conditions requiring skilled nursing services, such as tube feeding and comatose and quadraplegic care, in addition to patients' diagnoses.

The activities of daily living assessment is a frequently used measure of patient dependency and level of care required. The physical conditions assessed were those believed by both nursing home industry representatives in California and by the researchers to add substantially to the time, and hence the cost, of caring for patients *(12)*.

Measurement of resources used. Work sampling and time and motion studies were conducted in the study facilities in order to determine the amount of time expended to take care of nursing home patients according to their level of dependency in activities of daily living status and their need for special nursing services. Work sampling uses discrete and instantaneous observations of routine activities performed by a variety of staff personnel; time and motion studies employ continuous timed observations of a single person during a typical workday.

A work sampling study was conducted to measure the nursing time expended for patient-care activities in each of two categories. These are basic activities of daily living services received by most patients and special nursing services received by moderate- and/or heavy-care patients. About 3,800 observations were taken in 35 nursing homes between December 1980 and February 1981 by a team of trained registered nurses and licensed vocational nurses (practical nurses). Observations were taken between 7 a.m. and 7 p.m. and classified into 24 types of activity. The durations of specifc activities were used to determine the average amount of staff time spent in direct patient contact for each activity. Data also were collected on the skill mix of care providers, the percent distribution of RN, LVN, and nurses aide time, and the level of assistance provided, such as full or partial assistance. Details of the sample selection and data collection procedures are presented in appendix A.

A time and motion study was conducted for RNs and LVNs. They were followed continuously from 7 a.m. to 7 p.m. to determine the proportion of time spent in performing a given ADL or nursing function, as well as time for associated preparation, travel to and from residents, and cleanup. Time data also were collected on other activities not directly related to patient care.

Data on a total of 370 hours of activity were collected and classified into 44 discrete activities (24 of which were the set of activities obtained from the work sampling study). The remaining 20 activities included general housekeeping, staff meetings, social interaction with patients and their families,

other miscellaneous indirect patient-care activities, and downtime (personal time). These additional activities were collapsed into two overhead categories: overhead time and downtime. To classify the nursing times by activity, results from the work sampling study were used to calculate the direct patient-care contact time, and the results of the time and motion study were used to calculate the overhead and downtime burdens. A detailed description of the individual activities included in the overhead and downtime categories is shown in appendix A.

The time and motion study of the San Diego study did not assess activity times of nurses aides. Hence, only direct patient-care contact times were available for nurses aides from the work sampling study. However, time and motion data on nurses aides were collected in a previous NCHSR-sponsored study conducted in SNFs in Maryland and New York by a team of researchers from Johns Hopkins University *(6)*. The results of the San Diego time and motion study on licensed personnel, registered nurses and licensed vocational nurses, indicated that the proportion of licensed nurse time spent in overhead and downtime activities described above approximated within several percentage points the results of the data from the Hopkins study. Since the results of the Hopkins study were comparable to the San Diego data for licensed nursing staff, data from this source were used to impute indirect and overhead time for the nurses aides in the San Diego sample.

The total nursing staff time expended to provide assistance for a specific activity for a given patient day was calculated in the following way. First, the base time was calculated by taking the mean time expended to perform the activity multiplied by its frequency per 24-hour patient day. The proportions of time spent by the RN, the LVN and nurses aides conducting the activity also were determined. For example, if an RN and an aide were involved in providing the service, the total time expended by each person was added to obtain the total time required to provide the service. In the case of activities that were not performed daily, time requirements were weighted to give an expected daily amount. For example, a given patient will receive a full bath twice a week and a partial bath on the remaining days. Hence, the average per diem bathing time would be the sum of the expected daily full bath and partial bath times. Second, the base time was inflated by the indirect times (preparation, travel, and cleanup time) associated with the RN, LVN and/or aide conducting the activity to determine the total indirect time involved in providing the service. Third, the total patient activity time was inflated to account for overhead time and downtime, again according to the staff skill mix involved. In this manner, the total time expended to provide a given activity per 24-hour patient day was calculated for the RN, LVN and/or aide involved in performing the activity. The calculation procedures are described in appendix B.

Personal service and nursing activity times

Average times. The results of the work sampling and time and motion studies are in Tables 1 and 2. Table 1 shows the unit times for standard maintenance and nursing activities performed in the nursing homes along with sample sizes, standard deviations and standard errors for individual activities. The most time-consuming individual activity is feeding patients in need of total assistance, requiring more than 11 minutes of direct patient-care contact time. Considering that this activity occurs three times daily, totaling 33 minutes, the total staff time expended on feeding patients with this level of dependency is substantial. The unit time required to give a full bath is high also, almost 9 minutes. Since full baths are done usually only twice a week, with partial baths given the other days, the total daily time per patient for bathing is substantially less than for feeding. As can be seen from the standard deviations, there is substantial variation in times for all the specific activities. These variations are not surprising, given the fact that the times involved in providing a specific service are influenced by the patient's physical and emotional status, by staff time available and by the amount of social interaction. The large standard deviation for charting times, for example, may reflect the fact that charting usually is done at the end of the shift and is particularly sensitive to the amount of time available.

Table 2 shows the daily time expended per patient to perform these services along with the staff skill mix involved. The most time-consuming activities are assistance in feeding and in turning and positioning. Bathing and dressing are much less demanding in terms of staff time. Within specific activity categories, there is also a wide range of average times that reflect the level of disability associated with the need for assistance in areas such as mobility assistance, incontinence care and feeding assistance, as well as varying frequencies of need. For example, in the case of mobility assistance, various services

are employed. These include toileting assistance, transferring, walking and wheeling. While some patients may need only toileting assistance, other patients may need help in one or more of the other types of mobility assistance. Similarly, in the case of incontinence care, the variations in levels of need and the frequency of the individual episodes of incontinence result in a range of staff times expended.

The second column in Table 2 shows the additional time for preparation, travel and cleanup associated with each of the ADL and nursing activities. The relative amount of time expended to perform these services was generally greater for those that occur at unscheduled intervals, such as mobility assistance and incontinence care, than for those activities that can be scheduled, such as feeding assistance and bathing. Similarly, skilled services appear to require more time for these attendant activities than do the scheduled ADL services. The large amount of time for medications reflects additional time required to take vital signs and perform narcotic counts.

The third column gives the additional time for facility overhead and downtime. As mentioned earlier, overhead time includes such activities as patient socializing time and facility centered time, while downtime includes coffee break and lunch time. The amount of time added for these varied inversely with the skill level of the nurses providing the service. Overhead burdens were greatest for the nurses aides, since they spend a greater proportion of their time performing general housekeeping activities than do licensed nurses.

The fourth column shows the total time required to perform each ADL and skilled nursing service activity. It reflects the mean activity time multiplied

Table 1. Activity observation data (NCHSR Nursing Home Incentive-Reimbursement Study).

Activity[1]	N	Unit mean time in minutes	Standard deviation	Standard error of the estimate*
Medications	180	1.58	1.08	0.0807
ADL charts	187	2.39	8.11	0.6622
Bathing				
Quick/partial	67	4.91	2.17	0.2671
Full/total	141	8.69	7.02	0.5933
Dressing	68	2.55	1.99	0.2431
Mobility				
Toileting	190	2.97	2.52	0.1853
Transferring	363	1.06	1.20	0.0638
Walking	61	2.21	2.08	0.2805
Wheeling	265	1.08	0.81	0.0536
Incontinence				
Bladder	266	2.71	2.26	0.1388
Bowel	92	3.10	1.92	0.2013
Feeding				
Partial assistance	115	7.04	5.38	0.5039
Total assistance	508	11.07	5.36	0.2380
Tube feeding	122	3.43	1.15	0.1045
Turning and positioning	331	1.48	1.47	0.0809
Decubitus care	168	4.06	2.96	0.2291
Special skin care	145	2.31	2.20	0.1833
Skilled procedures	111	2.56	2.02	0.1926
Maintenance and rehabilitation	167	5.27	5.32	0.4129
Observation and assessment	30	0.98	0.77	0.1482
Vital signs	84	4.38	3.52	0.3864

[1] Excluded are activities for which the sample size was too small. These include grooming, which was combined with bathing, catheter care, bladder training, bowel training, and ostomy care.

* Sampling error is measured by the standard error of the estimate. It is calculated as $M\sqrt{N-1}$, where M is the standard deviation of the mean, and N is the number of observations. Approximately 68 out of 100 estimates from a sample would differ less than the standard error in each direction. Approximately 95 out of 100 differences between a sample estimate and the true mean, as computed from a complete count (or census), will be less than twice the standard error in each direction.

Source: National Center for Health Services Research and Health Care Technology Assessment. Long-Term Care Studies Program.

Table 2. Mean activity times in minutes per patient day, based on mean administration time, times frequency, plus preparation, cleanup and travel time burden, plus overhead and downtime burden (NCHSR Nursing Home Incentive-Reimbursement Study).

Procedure or activity	Mean administration time, times frequency per day	Preparation, cleanup and travel burden	Overhead and downtime burden	Total time	Staff skill mix in percents
Medications	5.0	12.0[1]	7.7	24.7	RN: 18.2 LVN: 81.8
Charting	10.7	—	6.0	16.7	RN: 7.4 LVN: 24.5 Aide: 68.1
Bathing and personal hygiene	5.3	1.3	4.2	10.8	RN: 0.1 LVN: 0.1 Aide: 99.8
Dressing	5.1	1.4	3.9	10.4	RN: 0.1 LVN: 0.1 Aide: 99.8
Mobility assistance Toileting, transferring, walking, wheeling	9.7[2]	15.3[3]	15.0	40.0	RN: 0.5 LVN: 2.2 Aide: 97.3
Incontinent care	9.7[4]	9.6[3]	11.8	31.1	RN: 0.4 LVN: 1.4 Aide: 98.1
Feeding assistance	27.3[5]	7.8[3]	21.2	56.3	RN: 2.4 LVN: 5.7 Aide: 91.9
Tube feeding	20.6	11.7	19.3	51.6	RN: 16.4 LVN: 83.6
Turning and positioning	17.8	4.7	13.5	36.0	RN: 1.8 LVN: 6.4 Aide: 91.8
Decubitus care	9.2	11.1	8.7	29.0	RN: 36.9 LVN: 63.1
Special skin care	5.8	7.0	5.6	18.4	RN: 34.8 LVN: 65.3
Skilled procedures (IV, O_2 therapy, sterile dressings, tracheotomy care, suctioning, inhalation therapy, multiple injections, irrigations)	6.7	12.5	8.7	27.9	RN: 23.6 LVN: 76.4
Maintenance and rehabilitation nursing (ROM, meal training, reality orientation, ambulation training, heat treatment, speech training)	8.5	2.3	6.5	17.3	RN: 2.9 LVN: 2.3 Aide: 94.8
Observation and assessment, vital signs	7.4	2.3	4.1	13.8	RN: 19.7 LVN: 25.4 Aide: 54.9
Observation and assessment	3.0	1.2	2.2	6.4	RN: 19.7 LVN: 25.4 Aide: 54.9
Vital signs	4.4	1.1	1.9	7.4	

[1] Includes the taking of vital signs and counting narcotics, which takes 2.3 minutes.
[2] The actual times range from 4.2 to 13.4 minutes, depending on the type and mix of mobility assistance, such as walking, wheeling, toileting, and transferring.
[3] Based on the weighted average of the mix and frequency of services performed.
[4] Depends on the type and mix of incontinent care, such as bladder, or bladder and bowel; bowel care takes 3.1 minutes and bladder care takes 16.3 minutes.
[5] Depends on the mix of feeding assistance, such as total or partial; total takes 32.2 minutes and partial takes 21.1 minutes.
Source: National Center for Health Services Research and Health Care Technology Assessment. Long-Term Care Studies Program.

by the daily frequency, plus the additional preparation, cleanup and travel time along with the overhead and downtime. The final column gives the staff skill mix for specific activities. As expected, virtually all of the assistance for ADL dependencies was provided by aides, while medically oriented services, such as decubitus care and special skin care, were the domain of licensed nurses.

Nursing times by ADL type. The unit and daily time requirements for specific nursing activities, presented above, reflect the average observed times of patients receiving such services, regardless of their overall level of dependency. To investigate the possibility that activity-specific times would vary by patient disability, activity-specific times for patients were compared according to an overall patient-classification scheme that is a slight variant of the patient-classification system used in the broader San Diego study.

In general, patients were categorized according to their number of ADL dependencies from Type A to Type E. In the broader study, Type A patients were classified as those patients dischargeable within 90 days. In this study, they were reclassified as patients dependent in two or fewer ADLs, including bathing or dressing, or both. In the original study, Type B patients were classified as being dependent in zero to four ADLs, but in this study were reclassified as being limited in three to four ADLs, which include toileting or transferring (mobility assistance) as well as bathing and dressing. Type C patients were defined as being limited in five ADLs, which include all the above plus incontinence. Type D patients were defined as limited in all six ADLs, which include all the above plus feeding. Type E patients were a heterogeneous group in that they could require one or more skilled nursing services, such as tube feeding, decubitus care or comatose care, in addition to personal care in all or some activities of daily living *(8, 9)*.

Table 3 gives the activity-specific times per patient day by the patient-classification system. These times exhibit considerable variation according to overall levels of dependency. For example, time for medication increases with disability level from 18 minutes for Type B patients to 30 minutes for Type D patients. Specific activity times, however, do not always increase with patient-impairment level. For example, in the case of dressing and bathing, absolute activity times tend to decrease as patient-impairment level increases. This possibly is because heavily dependent patients are sometimes bedridden, remain in hospital gowns and have services provided in bed. This may be the case particularly for the Type E patients in terms of mobility assistance.

Furthermore, it was found that the ADL classifications of Types A through E are not clear cut. For example, a small percent of Type B patients are incontinent and a small percent of Type C patients require feeding. No data are presented for Type E medication, charting and bathing time because of insufficient sample sizes. In spite of these constraints, Table 3 suggests that total activity time increases with overall dependency of patients.

Table 3. ADL nursing time per patient day according to patient ADL status (NCHSR Nursing Home Incentive-Reimbursement Study).

ADL service	Patient ADL status			
	B	C	D	E[1]
Medications	18.2	22.9	29.5	*
Charting	16.6	13.9	13.9	*
Bathing	11.8	13.1	10.3	*
Dressing	12.5	11.8	8.6	4.7
Mobility	28.3	37.8	59.4	32.0
Incontinent care	—	35.5	32.3	33.2
Feeding	—	—	64.4	76.4**
Total by ADL[2]	101.0	148.6	232.0	*

[1] Includes a variety of patients with needs for one or more special nursing services, including tube feeding, decubitus care, special skin care and/or comatose/quadraplegic care, in addition to ADL assistance.
[2] All ADL categories include an additional 13.6 minutes for Director of Nursing time, meal setup time, and miscellaneous activities that occur on a less than daily basis, such as weighing. This time was obtained from the Maryland study *(14)*.
* Data not presented owing to insufficient sample sizes.
** In some cases manual feeding time would be deducted and tube feeding time inserted.
Source: National Center for Health Services Research and Health Care Technology Assessment. Long-Term Care Studies Program.

Classification of patients according to level of care and resource consumption

Considering the variance in activity-specific times associated with overall patient level of impairment identified above, the manner in which activity times are allocated to patients will have an effect on total per diem time requirements for specific types of patients. The study examined the effects of three different allocation procedures on the absolute and relative times required to take care of patients by patient ADL category. The methods employed were: (1) the ADL-buildup method, which uses activity-specific average times regardless of overall impairment level; (2) the ADL-specific method, which uses the activity-specific average times conditional upon the patient's overall disability level; and (3) the management-minute method, which incorporates intra-ADL category variation.

In the first two methods the nursing and personal care activity times were assigned to individual patients in accordance with the ADL-status categories Types A through E. The third method assigned times to patients according to their assessed condition rather than the characteristics of their assigned groups, such as Type A through Type E.

The ADL-buildup method is based on the assumption that a given activity takes the same amount of time to perform regardless of the patient ADL status. Thus, the time required to bathe a patient is the mean time derived from all the observations on bathing, and is used for bathing times for all patients regardless of their ADL status. According to the classification system utilized, Type A patients are assumed to require assistance in bathing and dressing, and the total times for bathing and dressing are assigned to them. Similarly, for a Type B patient defined as dependent in four ADLs requiring help in mobility (toileting and transferring), the required staff time and costs to perform these services is added to the bathing and dressing time calculated for the Type A patient. In order to determine the per diem time required to take care of a Type C patient with five ADLs, the time for incontinence care is added to the time calculated for the already mentioned four activities. For Type D patients, feeding time is added to the times already calculated for the above five ADLs. For various categories of Type E patients, the skilled nursing activity times are added to the ADL maintenance times as needed. All patients are assigned medication time, charting time, Director of Nursing (DON) time and miscellaneous time. This miscellaneous time accounts for activities, such as weighing, that occur on a monthly basis and other activities that occur on an intermittent basis.

Using the ADL-specific method, daily time required to provide care for a patient according to the ADL type is derived only from observations of these activities performed on patients for the specific ADL type being calculated. This method is based on the premise that patient-impairment level will affect the length of time required to perform a specific personal care activity. For example, only bathing activity times obtained by observing Type B patients would be used to determine the mean bathing time for Type B patients.

Unfortunately, only about one-third of the activity observations could be linked to resident ADL classification because activity observations also were collected on non-study (private pay) residents who were not classified. Similarly, no data were collected on Type A patients, normally dependent in zero to two ADLs, because they were considered light care and dischargeable and, therefore, not the focus of the study. No data are presented for many Type E activities due to insufficient sample sizes. While the ADL-specific method has the advantage of providing more accurate times for specific types of patients, it suffers from the fact that the sample sizes are smaller.

The third method is based on a management-minute system developed by the National Health Corporation *(13)*. In this approach the individual nursing times for ADL services and special nursing services are applied directly to the individual patient's health status. This method provides the highest level of specificity on the patient's functional and physical status because it is developed from the individual resident assessment forms. In this case patient-specific data can be used to provide an exact measure of case mix at any time. For example, in the ADL-buildup method and ADL-specific method, Type B patients by definition are all assumed to require assistance in four ADLs, when in fact they may need help only in three ADLs. The management-minute system accounts for behavioral problems by augmenting overhead times by 10 percent. This method gives more detailed information on the Type A patients who, despite being short-term, postacute patients, often need personal care and skilled nursing services during their stay.

The overall per diem nursing times for nursing home patients according to impairment level are displayed in Table 4 according to the three different methods employed. In comparing the three time estimates for long-term care patients, no consistent pattern emerges, with an up to 20-percent variation in estimates for a given patient type. The greatest variation in estimates occurs with the Type A patient because this patient category includes some patients with temporary ADL needs and nursing service needs not accounted for with the buildup method. In the case of Type B patients, the highest time is calculated with the buildup method. This reflects the assumption that all such patients need assistance in four ADLs when some do not. This also reflects the fact that the overall mobility assistance time is used, which is significantly higher than the Type B-specific mobility assistance time used in the ADL-specific method.

The times for Type C patients are very similar for all three methods, since this category is least susceptible to vagaries in classification. The variation in estimates for Type D patients reflects complications in the classification, since some of these patients require special nursing services other than those qualifying for the ADL-buildup and ADL-specific classification procedures, such as oxygen therapy, which are incorporated in the management-minute method. Similarly, the large amount of time for mobility assistance also contributed to the higher times for the ADL-specific method. The time for Type E patients is difficult to compare because the sample is very small and heterogenous. For example, the discharge of one Type E patient requiring assistance in four ADLs and tube feeding, estimated to require 168 minutes of daily nursing time, and the admittance of another Type E patient dependent in six ADLs, plus being comatose, and estimated to require 437 minutes of daily nursing time, affects the average time measure significantly.

Regardless of the allocation method employed, and excluding Type A patients from the sample because of problems with their classification, the relative difference in time between the Type B and Type E patient is similar. The Type E patient requires about 2.5 times as much service time as the Type B patient. However, the absolute service times required to take care of a given patient are influenced by the allocation process.

Comparison of San Diego results with other nursing home resource-consumption studies

Table 5 compares estimates provided by the ADL-buildup method, the method used in the original study, with estimates from other studies on resource consumption in nursing homes. Because of the costs of such studies, there are only a few other instances in which this type of information has been collected. A comparison of average times across the few existing studies is presented for different patient ADL types. In the case of the Ohio and Maryland studies, the times presented are based on empirical data, although little information was available on sample sizes, standard deviations and standard errors for the activity-specific times presented *(4)*. The activity-specific times presented in the West Virginia study are normative, based on professional judgment.

From this table, it is apparent that overall patient per diem times calculated in San Diego are similar to those for Ohio and differ from those calculated in

Table 4. Comparison of calculated nursing minutes per patient day, according to the buildup method, ADL-specific method and management minutes method (NCHSR Nursing Home Incentive-Reimbursement Study).

Patient ADL status	Buildup	ADL-specific	Management minutes
A	76.1	*	95.2
B	116.1	101.0	100.7
C	147.2	148.6	147.8
D	203.5	232.0	234.3
E and others[1]	285.2	*	252.3

[1] Based on weighted average mix of patients with need for one or more special nursing services, in addition to ADL assistance, in facilities at onset of experiment, May 1981.
* Not applicable.
Source: National Center for Health Services Research and Health Care Technology Assessment. Long-Term Care Studies Program.

Maryland and West Virginia. A comparison of activity-specific times reveals no distinct patterns. The differences in time among the prior studies appear to be similarly large *(4)*. Within the studies, however, the relative difference between the time required to care for a light-care patient and a heavy-care patient is roughly similar. Heavy-care patients require 2.5 to 3 times the amount of staff effort required for light-care patients.

Summary

The work sampling estimates presented in this report add to the relatively small information base on activity-specific nursing time expended to care for nursing home patients. The results illustrate the difficulties involved in deriving such information. These include factors determining mean activity times, the method by which activities are burdened by indirect associated times, definitional problems with the classification system, and the method by which activity times are allocated to patients according to ADL type.

The mean ADL and nursing activity times presented in Table 1 reflect many influences, including the available supply of personnel, social interaction time and overall impairments of patients, such as their behavioral and emotional status. For example, it takes much less time to provide a service to a cooperative patient than to an uncooperative patient. Similarly, in a facility which is understaffed, activites must be conducted much more expeditiously than in a facility which is not understaffed. These time variations are highlighted by the large standard deviations and standard errors presented. If it were possible to obtain still larger sample sizes, deviations around the mean might be smaller, but the costs involved in such an undertaking would be very high.

The associated preparation, travel and cleanup burdens, as well as overhead and downtime burden, serve to significantly increase the individual activity times. As can be seen in Table 2, these triple the total time involved in the ADL activities of mobility as-

Table 5. Comparison of calculated number of minutes of nursing per patient day required to care for hypothetical patients at varying levels of need for assistance, according to various work sampling studies (NCHSR Nursing Home Incentive-Reimbursement Study).

ADL service	San Diego	Maryland	Ohio	West Virginia
Light-care patient needing assistance in 2 ADLs				
Medications	41[1]	87[2]	16	30
Personal hygiene	21[3]	—	52	48
Total nursing time	62	87	68	78
Moderate-care patient needing assistance in 5 ADLs				
Medications	41[1]	116[2]	16	30
Personal hygiene	21[3]	—	52	48
Mobility	40[4]	—	61	32
Incontinence care	31	—	12	18
Total nursing time	133	116	131	128
Heavy-care patient needing assistance in 6 ADLs				
Medications	41[1]	171[2]	16	30
Personal hygiene	21[3]	—	52	48
Mobility	40[4]	—	61	32
Incontinence care	31	—	12	18
Tube feeding	52	58	58	80
Total nursing time	185	228	189	208

[1] Includes charting time, but excludes the additional 13.6 minutes for meal setup and Director of Nursing time, since not included in the other studies.
[2] Overall time because time is not disaggregated according to personal care activity.
[3] Personal hygiene includes bathing and dressing.
[4] Mobility assistance includes toileting and transferring.
Source: Foley, S.M., M.A. Zahn *et al*, reference 4.

sistance and incontinence care because these activities occur frequently through the day and on an unscheduled basis. Similarly, the amount of burden time triples the total time expended for skilled nursing services, since these services often require significant additional time for preparation and cleanup activities.

ADL-impairment level also significantly affects activity times. These effects are seen in Table 3. What is interesting about the relationship between impairment level and ADL-activity time is the fact that it is not always straightforward. For example, in the case of mobility assistance, nursing time increases substantially from Type B patients to Type D patients and then declines, as does dressing time for Type E patients, who are usually bedridden.

The ADL-classification system sometimes presents definitional problems. For example, by definition it is assumed that Type E patients are the only ones requiring special nursing services when in fact other patients require these services, although possibly on a less frequent basis. Finally, the method by which activity times are allocated to patient-classification types has a significant effect on the daily times calculated. As seen in Table 4, the allocation procedure has the least effect on the Type C patient, but causes a 13- to 15-percent variation in times calculated for Types B and D patients. Despite the differences in the absolute nursing times calculated according to patient type, the relative difference between a Type B patient and a Type E patient is about 2.5 times. This relative variation between a light-care patient and a tube-fed, heavy-care patient also occurs across the four studies presented in Table 5, despite the larger variation in absolute nursing times across the studies.

The estimates presented from the San Diego study provide further information on the direct relationship between impairment level and resource consumption. Furthermore, these results extend the information base for the development of a relative resource-consumption, case-mix reimbursement system. The study also provides further information on the difficulties entailed in the calculation of absolute resource consumption for nursing home patients.

The results suggest that further consideration be given to implementing a case-mix reimbursement system that uses moderate-care (5-ADL) patients as a reference group. The reimbursement levels for lighter care and heavier care patients could then be priced according to the difference between them and the moderate-care patient. The use of the moderate-care patient as the standard is suggested because the absolute resource-consumption times were the same across the three different classification procedures examined, compared to a 13- to 15-percent variation for most other patient types. Also, the resource-consumption times calculated for the moderate-care group exhibited the least variation among the other resource-consumption studies presented, with the variation being 15 percent for this group compared to up to 40 percent for the light-care group.

Appendixes

A. Sample selection and data collection procedure

The sample of observations of a given activity was drawn from the study homes in San Diego. Data from the initial assessments provided the necessary information for sample selection, such as resident type, and those activities and procedures requiring nursing time. In most cases, the sample selection of residents to be observed for a given activity was random. However, as the number of residents requiring a given service became small (for instance, tube feeders), it was necessary to take repeated measures of the universe of residents over an extended period of time.

The sample selection approach for each activity in the work sampling substudy was as follows. First, residents requiring a given activity were identified by a given facility in the study site. Second, proportionate stratified techniques were used, each facility was a stratum, and sampling weights were assigned to each stratum. Third, sampling weights were applied to determine the observations to be taken in the facilities requiring a given activity. Fourth, observations were randomly selected from the pool of residents within the facility requiring a given activity.

While several activities occurred on a regularly scheduled basis (such as feeding, dressing and grooming), many others (bathing, bladder training, catheter/ostomy care, etc.) occurred at various times of day. Therefore, it was necessary for the work sampling team leader to coordinate as much as possible the team members' schedules with the routine of the facilities. Still, some other activities, such as mobility assistance and overall management, occurred at impromptu times, and, therefore, it was quite difficult to schedule team members to capture these activities.

The study team measured the time spent by members of the nursing staff in delivering care. If more than one member of the nursing staff was involved in delivering a given service to a sample resident, this fact was noted on the activity observation worksheet. The total time spent by all nursing personnel involved in the delivery of a given unit of service was recorded. Only direct nursing time was clocked. In most instances, the team member stayed with the resident until the activity was completed. In the event that a nurses aide was providing a similar service to more than one sample resident simultaneously, it was necessary to follow the nurses aide and to clock the direct care for each of the sample residents for whom the nurses aide was providing that service. In total, data were collected on 24 different activities. The sample sizes and times are displayed in Table 1 along with standard deviations and standard errors.

Data were recorded on a standard worksheets. The observer indicated:

(a) which activity was observed;
(b) the level of staff member performing the activity;
(c) the type of assistance, either partial or total;
(d) the amount of direct nursing time spent in activity performance;
(e) where applicable, the number of times a day an activity was usually performed for a patient.

Instances in which such data were collected include tube feeding, bowel and bladder training, and turning and positioning. These represent regularly scheduled activities, which were usually performed more than once a day; the activity data also were linked to patient ADL status so that the variation in times recorded was related to this variable.

The individual activity time data collected through the work sampling and time and motion studies were collapsed into the six activity groups defined below. The individual activities included in each of the six classifications are shown. The first group also is known as the direct activity time, the second through fifth groups as overhead time, and the sixth group as downtime.

(1) **Direct patient-contact time** includes not only direct contact time as measured in the activity observation study, but also preparation, travel and cleanup time. These times were distinguished from direct contact time by a special code where applicable.

(2) **Indirect patient-care time** includes talking with other staff and physicians, patient-centered clerical work (such as assembling charts and transcribing orders), and giving instructions.

(3) **Other direct patient-care time** includes conversing with patients, listening to general complaints, and talking with family members.

(4) **Education-centered time** includes in-service training and equipment demonstrations by supply company representatives.

(5) **Facility- and/or unit-centered time** involves general housekeeping around the nursing station;

obtaining general supplies, such as clerical supplies; and answering phones when calls are not of a patient-related nature.

(6) **Downtime** is coffee and lunch breaks, bathroom breaks, and personal conversation with other staff or personal phone calls.

B. Computation of burdened procedure mean times

Each direct patient-care activity type has five components:

(1) Preparation of materials and supplies
(2) Administration of the treatment or service
(3) Travel to and from the resident
(4) Cleanup or cleaning after the care tasks associated with the activity and
(5) Facility overhead and personal time by staff category.

The burdened procedure mean times were computed in the following steps:

Step 1. Calculate the average per patient service (such as administration) delivery time. Administration time is that time spent in direct patient contact, or time actually performing a service (for instance, bathing a resident). Table 1 displays the individual mean administration times. These data come from the work sampling activity observation file (such as, mean unit decubitus care time = 4.06 minutes).

Step 2. Multiply the mean procedure time by the average number of times per day that the service is delivered (frequency of occurence). These data come from the activity observation file. This is enumerated in Table 2 (such as, frequency 2.27 times/day x 4.06 = 9.21).

Step 3. Sum the total time spent in preparation, travel, administration and cleanup for a given activity type. Calculate the percentage of this time to the total activity. These data come from the nurse observation time and motion file for RNs and LVNs, and from the Maryland study for nurses aides. The Maryland data (*14*) on nurses aides were used as opposed to the Hopkins data because they applied to direct patient care only, not to all care. These data were comparable to the San Diego data and Hopkins data (*6*) for RNs and LVNs.

Step 4. The preparation, cleanup, and travel burden is calculated as a ratio buildup. That is, the ratio of the percent of preparation, cleanup, and travel time, to the percent of time for the whole activity, minus the preparation, cleanup and travel time percent, times the administration time, in minutes, as calculated in Step 2. For example:

Preparation, cleanup and travel = 04.1 minutes

Administration time = 04.1 minutes

Total time = 08.2 minutes

Percent prep/cleanup/travel = 50.0

$$9.21 \times \left(1 + \frac{.50}{1-.50}\right) = 2.0 \times 9.21 = 18.4 \text{ minutes}$$

A general treatment buildup is added at 10.29% x 18.4 = 1.9 + 18.4 = 20.3

Step 5. Compute the staff skill mix for each procedure as obtained from the activity observation file and displayed in Table 2, last column. Multiply the activity time calculated above by the percent of time rendered by each skill category to obtain the time component of the activity rendered by that skill type. For example:

Decubitus care, RN 36.9%, and LVN 63.1%. Direct time for decubitus care = 20.3 minutes, as calculated in steps 1 through 4.

Therefore, RN is 36.9% x 20.3 = 7.5 minutes, and

LVN is 63.1% x 20.3 = 12.8 minutes

Step 6. Overhead and personal time burdens are calculated as below by using a ratio buildup as in step 4 (that is, the ratio of the percent of time spent in overhead and personal time to the percent of time for the whole day, minus the overhead and personal time percent, times skill-specific direct activity time calculated in step 5. The percentage of each day devoted to overhead and personal time was calculated to be 25.27 for RNs, 32.55 for LVNS, and 38.14 for aides. These data come from the Johns Hopkins study (*6*). For example:

Decubitus care time from steps 1 through 4 = 20.3 minutes.

Staff skill-mix contribution is 36.9% RN, 63.1% LVN, equaling 7.5 minutes and 12.8 minutes, as calculated in step 5.

$$\text{RN} = 7.5 \times \left(1 + \frac{.2527}{1-.2527}\right) = 10.0 \text{ minutes}$$

$$\text{LVN} = 12.8 \text{ minutes} \left(1 + \frac{.3255}{1-.3255}\right) = 19.0 \text{ minutes}$$

10.0 + 19.0 = 29.0 minutes

References

1. Waldo, D.R., K.R. Levit, H. Lazenby. National health expenditures, 1985. *Health Care Financing Review*, 8(1):1-21, Fall 1986.

2. *Health Care Financing Program Statistics: Analysis of State Medicaid Program Characteristics, 1984*, HCFA Publication No. 03204. U.S. Department of Health and Human Services, Health Care Financing Administration, August 1985.

3. Fox, P.D., S.B. Clauser. Trends in nursing home expenditures: Implications for aging policy. *Health Care Financing Review*, 2(2):65-70, Fall 1980.

4. Foley, S.M., M.A. Zahn, R.E. Schlenker, J.L. Johnson. *Case Mix Measures and Medicaid Nursing Home Payment Rate Determination in West Virginia, Ohio, and Maryland*, Study Paper 1, grant 18-P-98306/8, Center for Health Services Research, University of Colorado Health Sciences Center, Denver, CO. U.S. Department of Health and Human Services, Health Care Financing Administration, March 1984.

5. McCaffree, E. *et al. Long-Term Care Case Mix Compared to Direct Care Time and Costs*, final report, contract HRA-230-76-0285, Battelle Human Affairs Research Centers. U.S. Department of Health and Human Services, National Center for Health Services Research, February 1979.

6. Cavaiola, L.J., J.P. Young. An integrated system for patient assessment and classification and nurse staff allocation for long term care facilities. *Health Services Research*, 15(1):281-306, 1980.

7. Weissert, W.G., W.J. Scanlon, T.T.H. Wan, D.E. Skinner. Care for the chronically ill: Nursing home incentive payment experiment. *Health Care Financing Review*, 5(2):41-49, Winter 1983.

8. Meiners, M.R., P.E. Thorburn, P.C. Roddy, B.J. Jones. *Nursing Home Admissions: The Results of an Incentive Reimbursement Experiment*, Long-Term Care Studies Program Research Report, DHHS Publication No. (PHS) 86-3397. U.S. Department of Health and Human Services, National Center for Health Services Research and Health Care Technology Assessment, October 1985.

9. Katz, S., A.B. Ford *et al.* Studies of illness in the aged. The index of ADL: A standardized measure of biological and psychosocial function. *Journal of the American Medical Association*, 185:914-919, 1963.

10. Fries, B.E., L.M. Cooney, Jr. Resource utilization groups: A patient classification system for long-term care. *Medical Care*, 23(2):110-122, February 1985.

11. Cooney, L.M. Jr., B.E. Fries. Validation and use of resource utilization groups as a case-mix measure for long term care. *Medical Care*, 23(2):123-132, February 1985.

12. Kane, R.A., R.L. Kane. *Assessing the Elderly: A Practical Guide to Measurement*. D.C. Heath, Lexington, MA, 1981.

13. Adams, C.E., J. Williams. *Patient Assessment Computerized*. National Health Corporation, Murfreesboro, TN, 1980.

14. Skilled Nursing Facility Services. In *Maryland Register*, 9(20), October 1982.

*U.S. G.P.O. 1987-181-345:60020

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. NCHSR 87-27	2.	3. Recipient's Accession No.

4. Title and Subtitle
Resource Requirements of Nursing Home Patients Based on Time and Motion Studies, NCHSR Health Care for the Aging

5. Report Date
April 1987

6.

7. Author(s)
Roddy, Pamela C., Korbin Liu, Mark R. Meiners

8. Performing Organization Rept. No.

9. Performing Organization Name and Address
DHHS, PHS, OASH, National Center for Health Services Research and Health Care Technology Assessment (NCHSR)
Publications and Information Branch, 18-12 Parklawn Building
Rockville, MD 20857 Tel.: 301/443-4100

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G) N.A.

12. Sponsoring Organization Name and Address
Same as above

13. Type of Report & Period Covered
In house

14.

15. Supplementary Notes
DHHS Publication No. (PHS) 87-3408
Long-Term Care Studies Research Report No. 4

16. Abstract (Limit: 200 words)

This research report presents results from a study of the amount and intensity of nursing home staff time required to care for patients at various care levels. These levels are defined as light, moderate, and heavy--depending on the time and amount of assistance required to perform various nursing and daily living activities such as mobility and feeding assistance, personal hygiene, skilled procedures, and special skin care. Work sampling and time and motion studies for registered nurses, nurses' aides, and licensed vocational nurses showed that heavy-care patients required over 2.5 times the amount of staff effort required for light-care patients. This was true regardless of the manner in which the activity times were assigned. The report also compares these results from a demonstration in California with those of three earlier studies in Maryland, Ohio, and West Virginia. This study, part of a larger demonstration project on reimbursement incentives for nursing homes, was sponsored by the National Center for Health Services Research and Health Care Technology Assessment and conducted in 36 proprietary skilled nursing facilities over a 30-month period beginning in November 1980.

17. Document Analysis a. Descriptors
NCHSR publication of research findings does not necessarily represent approval or official endorsement by the National Center for Health Services Research and Health Care Technology Assessment or the U.S. Department of Health and Human Services.

b. Identifiers/Open-Ended Terms
Health services research, long-term care, nursing home patients

c. COSATI Field/Group

18. Availability Statement:	19. Security Class (This Report)	21. No. of Pages
Releasable to the public. Available from National Technical Information Service, Springfield, VA 22161 Tel.: 703/487-4650	Unclassified	20
	20. Security Class (This Page) Unclassified	22. Price

CMS LIBRARY
3 8095 00014414 3

DEPARTMENT OF
HEALTH & HUMAN SERVICES

Public Health Service
National Center for Health Services Research
and Health Care Technology Assessment
Parklawn Building, Room 18-12
Rockville MD 20857

Official Business
Penalty For Private Use $300

BULK RATE
POSTAGE & FEES PAID
PHS/NCHSR
Permit No. G-282

45 013994
JOANN JACKSON
INFORMATION RESOURCES TECHNICIAN
PUBLICATIONS/INFO RESOURCES BRANCH
HEALTH CARE FINANCING ADMINISTRATION
6325 SECURITY BLVD.
BALTIMORE, MD 21207

OAK.m 1.A.9

DHHS Publication No. (PHS) 87-3408